

DATA SHEET

BUJ103AX

Silicon Diffused Power Transistor

Product specification

August 2018

Silicon Diffused Power Transistor

BUJ103AX

GENERAL DESCRIPTION

High-voltage, high-speed planar-passivated npn power switching transistor in a plastic full-pack envelope intended for use in high frequency electronic lighting ballast applications, converters, inverters, switching regulators, motor control systems, etc.

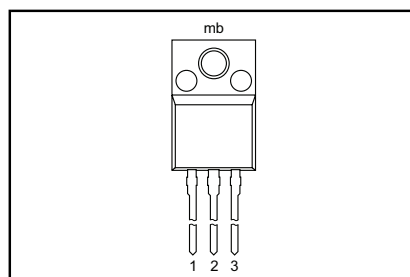
QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_{CESM}	Collector-emitter voltage peak value	$V_{BE} = 0\text{ V}$	-	700	V
V_{CBO}	Collector-Base voltage (open emitter)		-	700	V
V_{CEO}	Collector-emitter voltage (open base)		-	400	V
I_C	Collector current (DC)		-	4	A
I_{CM}	Collector current peak value		-	8	A
P_{tot}	Total power dissipation	$T_{hs} \leq 25\text{ °C}$	-	26	W
V_{CEsat}	Collector-emitter saturation voltage		0.25	1.0	V
h_{FEsat}	DC current gain	$I_C = 3\text{ A}; V_{CE} = 5\text{ V}$	12.5	-	
t_f	Fall time	$I_C = 2\text{ A}, I_{B1} = 0.4\text{ A}$	33	80	ns

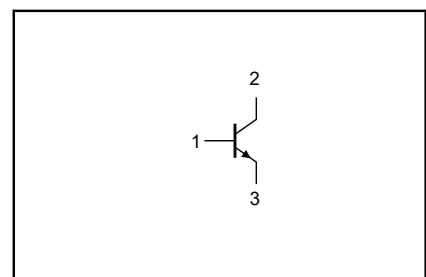
PINNING - SOT186A

PIN	DESCRIPTION
1	base
2	collector
3	emitter
mb	solated

PIN CONFIGURATION



SYMBOL



LIMITING VALUES

Limiting values in accordance with the Absolute Maximum Rating System (IEC 134)

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CESM}	Collector to emitter voltage	$V_{BE} = 0\text{ V}$	-	700	V
V_{CEO}	Collector to emitter voltage (open base)		-	400	V
V_{CBO}	Collector to base voltage (open emitter)		-	700	V
I_C	Collector current (DC)		-	4	A
I_{CM}	Collector current peak value		-	8	A
I_B	Base current (DC)		-	2	A
I_{BM}	Base current peak value		-	4	A
P_{tot}	Total power dissipation	$T_{hs} \leq 25\text{ °C}$	-	26	W
T_{stg}	Storage temperature		-65	150	°C
T_j	Junction temperature		-	150	°C

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
$R_{th\ j-hs}$	Junction to heatsink	with heatsink compound	-	4.8	K/W
$R_{th\ j-a}$	Junction to ambient	in free air	55	-	K/W

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ISOLATION LIMITING VALUE & CHARACTERISTICT_{hs} = 25 °C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V _{isol}	R.M.S. isolation voltage from all three terminals to external heatsink	f = 50-60 Hz; sinusoidal waveform; R.H. ≤ 65% ; clean and dustfree	-		2500	V
C _{isol}	Capacitance from T2 to external heatsink	f = 1 MHz	-	10	-	pF

STATIC CHARACTERISTICST_{hs} = 25 °C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I _{CES}	Collector cut-off current ¹	V _{BE} = 0 V; V _{CE} = V _{CESMmax} ; V _{BE} = 0 V; V _{CE} = V _{CESMmax} ; T _j = 125 °C	-	-	1.0	mA
I _{CBO}	Collector cut-off current ¹	V _{CBO} = V _{CESMmax} (700V) V _{CEO} = V _{CEOMmax} (400V)	-	-	0.1	mA
I _{EBO}	Emitter cut-off current	V _{EB} = 7 V; I _C = 0 A	-	-	0.1	mA
V _{CEOsust}	Collector-emitter sustaining voltage	I _B = 0 A; I _C = 10 mA; L = 25 mH	400	-	-	V
V _{CEsat}	Collector-emitter saturation voltage	I _C = 3.0 A; I _B = 0.6 A	-	0.25	1.0	V
V _{BEsat}	Base-emitter saturation voltage	I _C = 3.0 A; I _B = 0.6 A	-	0.97	1.5	V
h _{FE}	DC current gain	I _C = 1 mA; V _{CE} = 5 V	10	17	32	
h _{FE}	DC current gain	I _C = 0.5 A; V _{CE} = 5 V	12	20	32	
h _{FEsat}	DC current gain	I _C = 2 A; V _{CE} = 5 V	13.5	16	20	
		I _C = 3 A; V _{CE} = 5 V	-	12.5	-	

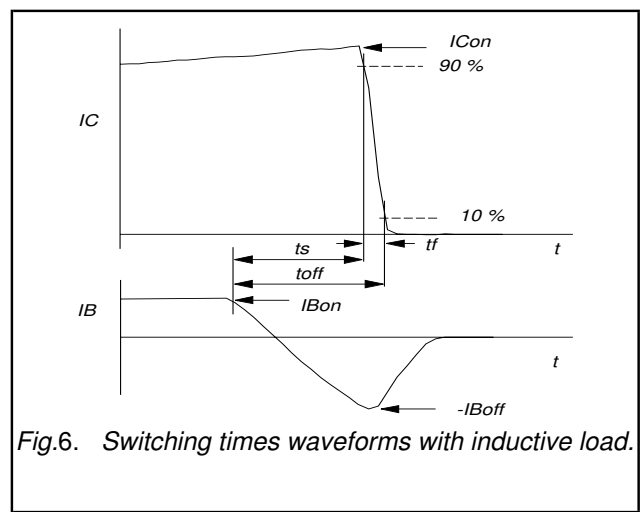
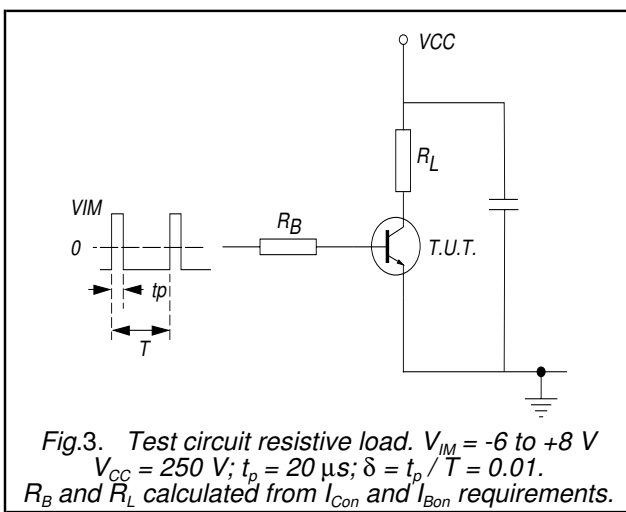
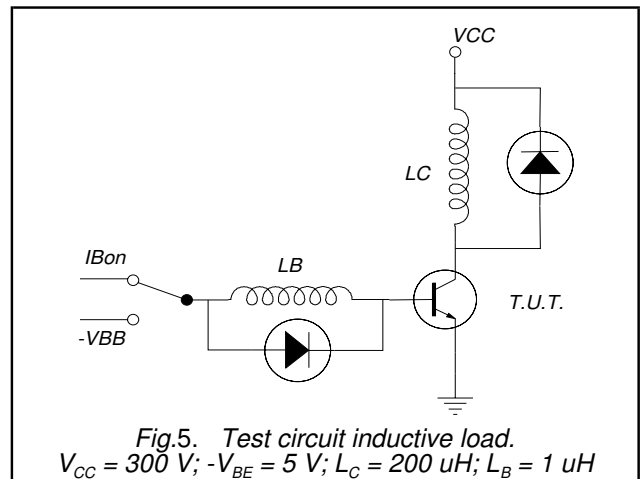
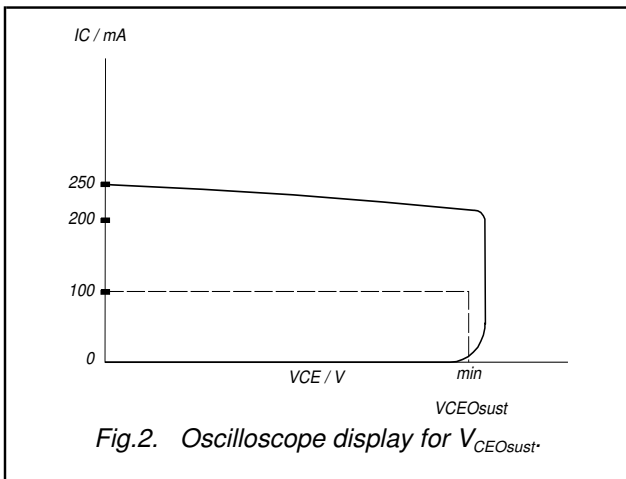
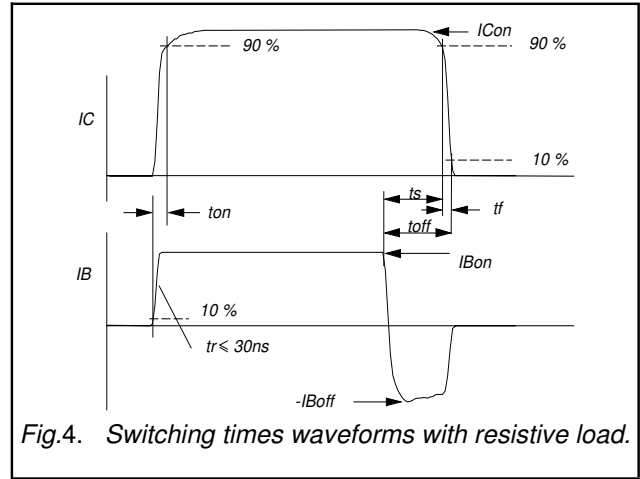
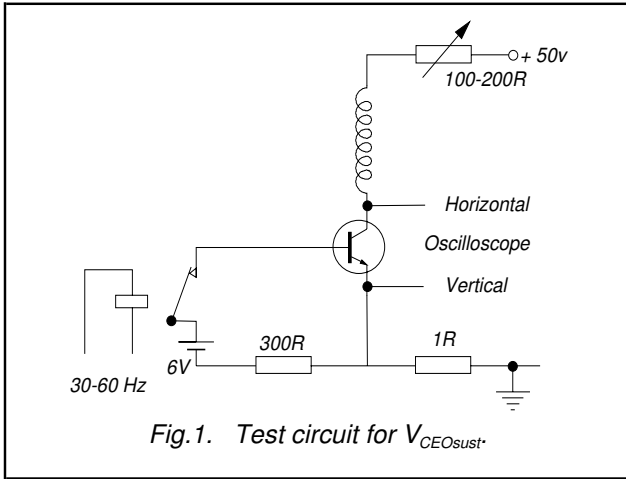
DYNAMIC CHARACTERISTICST_{hs} = 25 °C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
	Switching times (resistive load)	I _{Con} = 2.5 A; I _{Bon} = -I _{Boff} = 0.5 A; R _L = 75 ohms; V _{BB2} = 4 V;			
t _{on}	Turn-on time		0.52	0.6	μs
t _s	Turn-off storage time		2.7	3.2	μs
t _f	Turn-off fall time		0.3	0.43	μs
	Switching times (inductive load)	I _{Con} = 2 A; I _{Bon} = 0.4 A; L _B = 1 μH; -V _{BB} = 5 V			
t _s	Turn-off storage time		1.2	1.33	μs
t _f	Turn-off fall time		33	80	ns
	Switching times (inductive load)	I _{Con} = 2 A; I _{Bon} = 0.4 A; L _B = 1 μH; -V _{BB} = 5 V; T _j = 100 °C			
t _s	Turn-off storage time		-	1.8	μs
t _f	Turn-off fall time		-	200	ns

1 Measured with half sine-wave voltage (curve tracer).

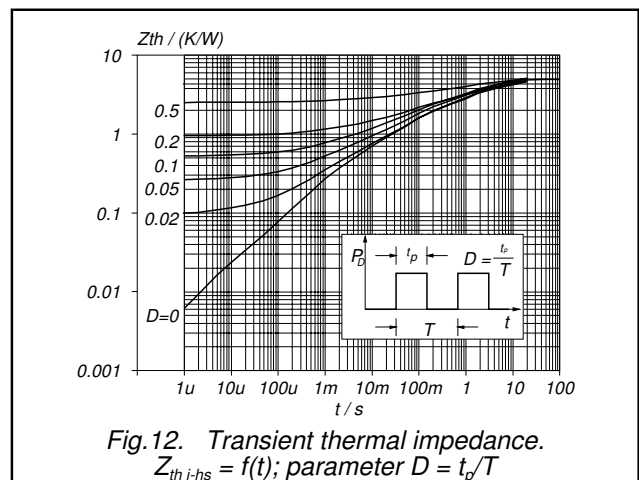
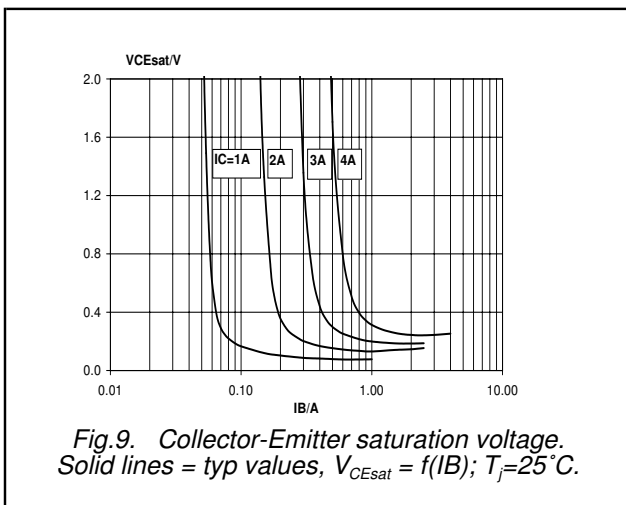
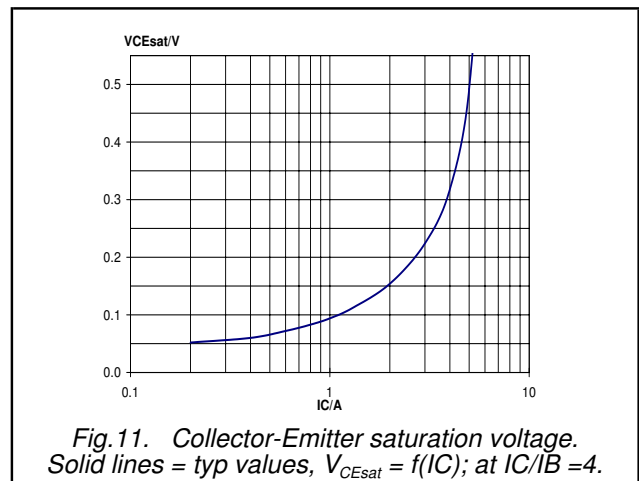
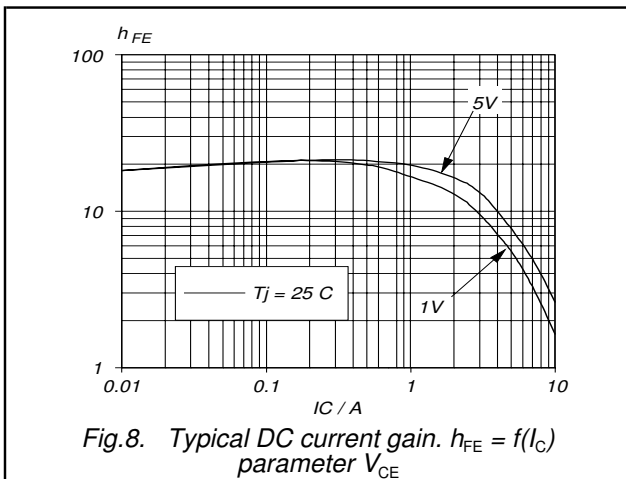
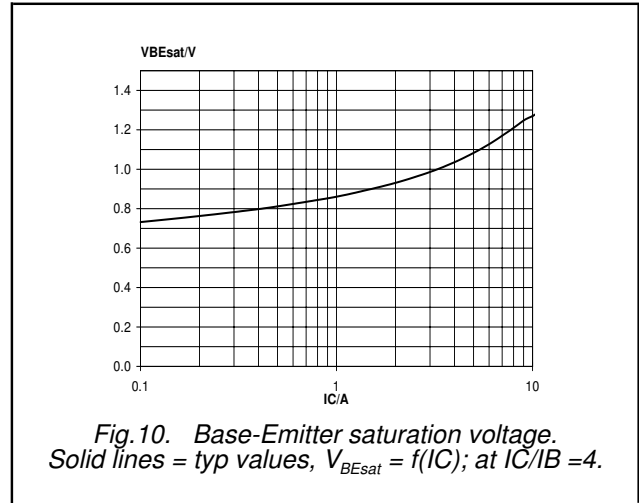
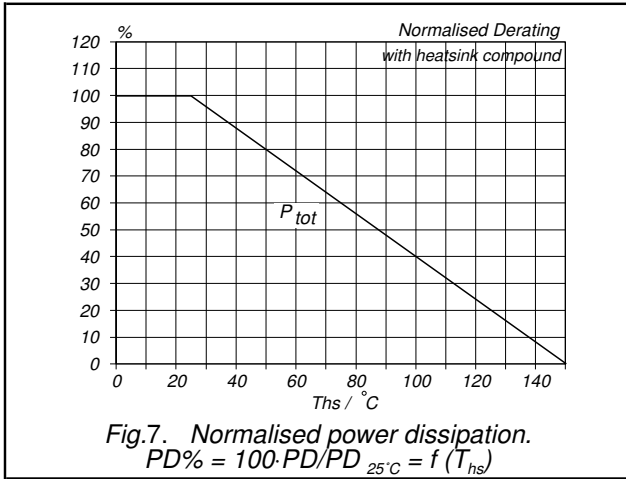
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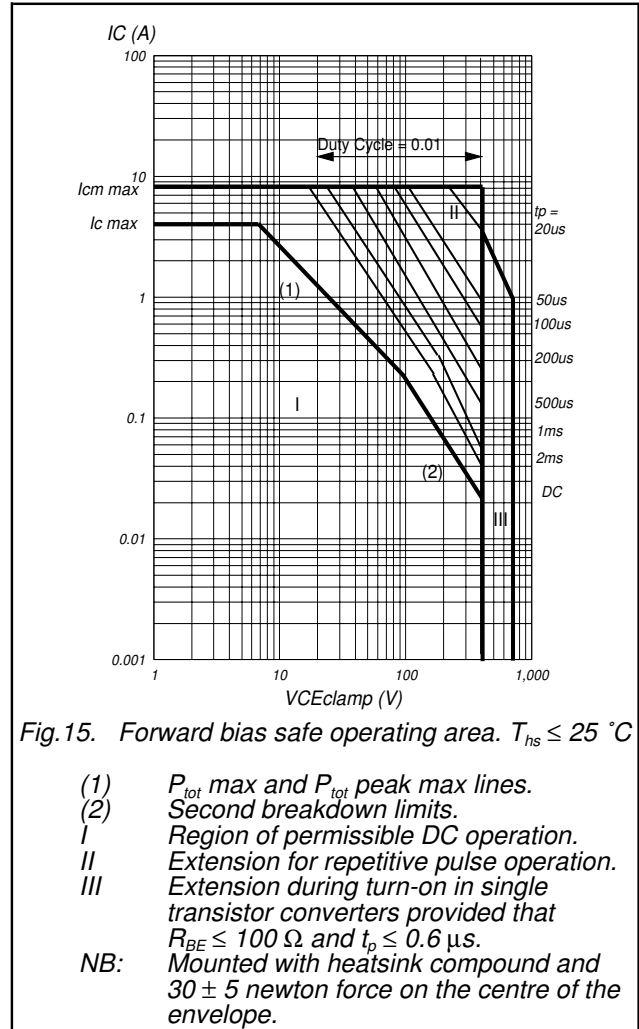
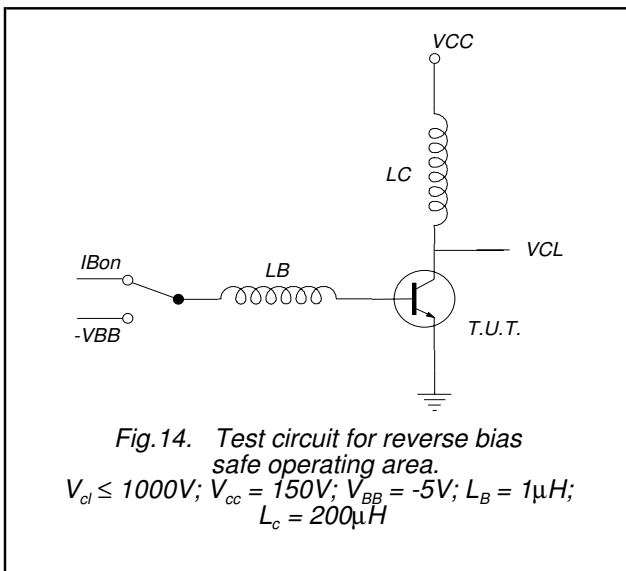
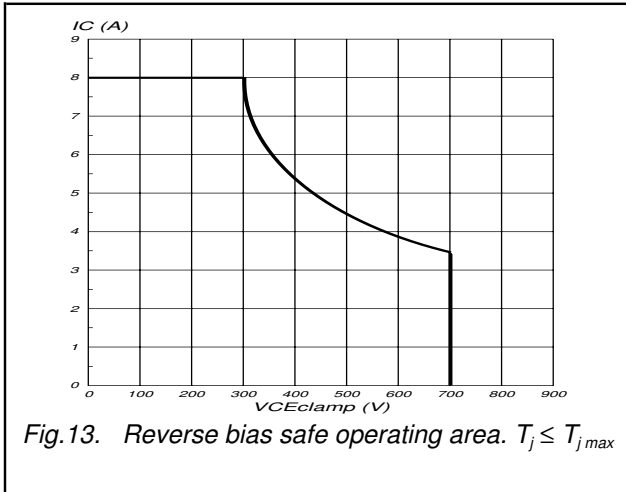
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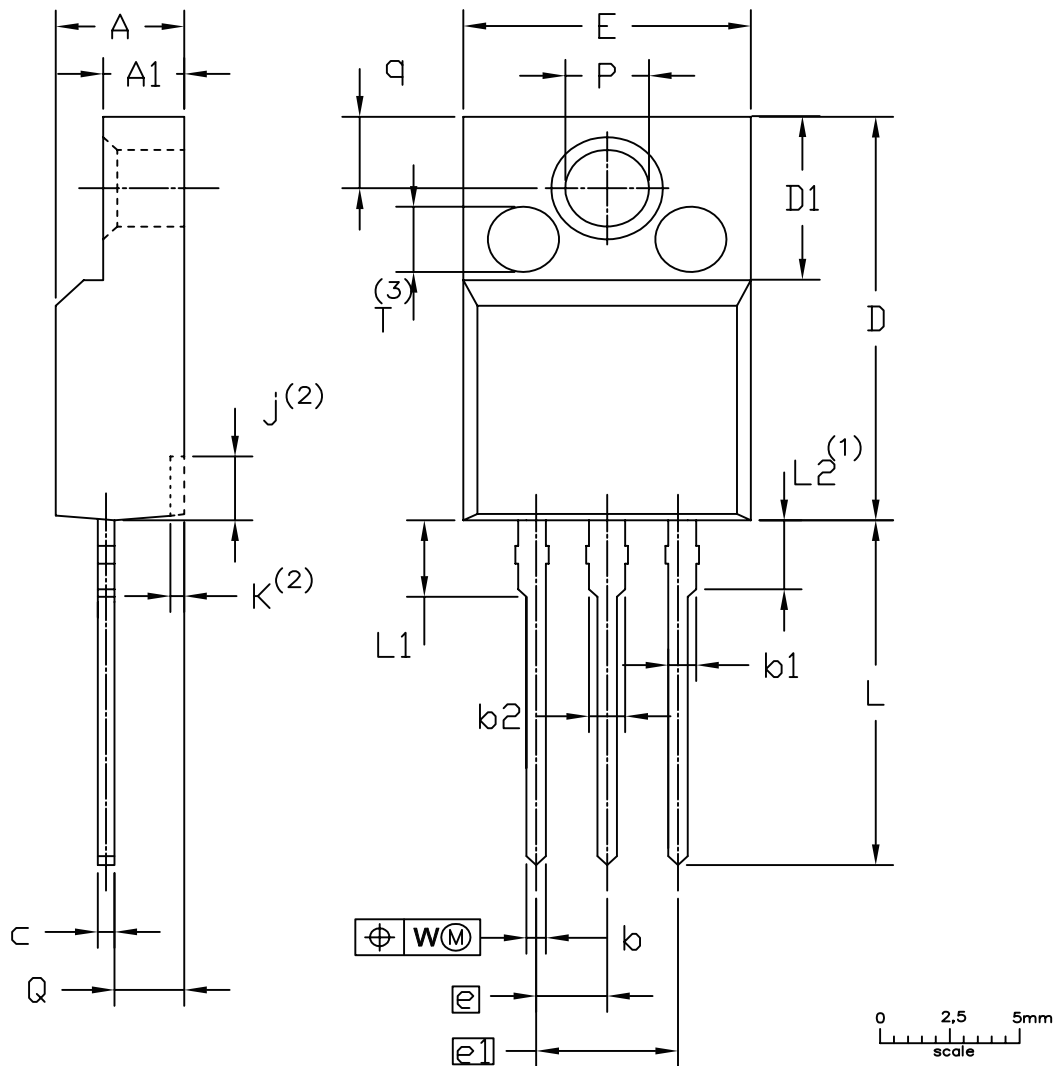
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MECHANICAL DATA

Plastic single-ended package; isolated heatsink mounted; 1 mounting hole; 3-lead TO-220 "full pack"

SOT186A



UNIT	A	A1	b	b1	b2	c	D	D1	E	e	e1	j ⁽²⁾	k ⁽²⁾	L	L1	L ₂ ⁽¹⁾ max.	P	Q	q	W	T ⁽³⁾
mm	4.6	2.9	0.9	1.1	1.4	0.7	15.8	6.5	10.3			2.7	0.6	14.4	3.30		3.2	2.6	3.0	0.4	2.5
	4.0	2.5	0.7	0.9	1.0	0.4	15.2	6.3	9.7	2.54	5.08	1.7	0.4	13.5	2.79	3	3.0	2.3	2.6		

Notes

- 1. Terminal dimensions within this zone are uncontrolled
- 2. Dot lines area designs may vary
- 3. Eject pin mark is for reference only

OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
SOT186A		3 LEADS TO220F			2013-11-14

Legal information

Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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